

# Rational Decision Making

Economics analyzes human behavior by making behavioral assumptions – about how persons act in different environments

- Rationality is the most basic of these

**Rationality**: in a situation, persons will consider the benefits and costs involved and base their decision on *both* of these

Rational decisions require weighing both:

Benefits – how you perceive you will be made better off as the result of activity

Costs = direct + indirect

Indirect cost: opportunity costs – the value of what you must give up to do this activity

Direct Cost: dollar costs involved

**Rule 1**: *Undertake an activity only when perceived benefits exceed the perceived costs  
⇒ Benefits are more than worth their cost*

## Based on this rule:

- (1) If benefits are “high,” the activity is not necessarily worthwhile (consider costs also)
- (2) If costs are “high,” this activity should not necessarily be ruled out (view benefits also)
- (3) To encourage an activity, increase benefits relative to cost
  - raise benefits given costs
  - lower costs given benefits
  - have benefits rise more than costs are rising

Ex: - Student loan programs  
- Subsidies to industries/individuals

- (4) To discourage an activity, raise costs relative to benefits
  - this is often done by raising the likelihood of incurring the cost – ENFORCEMENT

|   |
|---|
| <b>Expected Cost</b> = probability of getting caught x amount of fine (penalty) |
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Ex: given speeding ticket \$, greater is probability of getting caught, higher expected cost of speeding

## Rational activity is *not* necessarily legal activity

Ex: exceeding legal speed limit

Benefits: save time, can use the saved time for desirable activities

Costs: less gas mileage, *expected* cost of ticket, higher *expected* insurance costs yearly

-As long as perceived benefits exceed perceived costs, persons will speed on highway, even though it is illegal

With “catch the drivers” campaign by police: the probability of getting caught rises *relative* to benefits. With higher *expected* cost, fewer people will exceed the speed limit

Use this framework to explain:

How government treats polluting firms

How student loans encourage more people to attend college

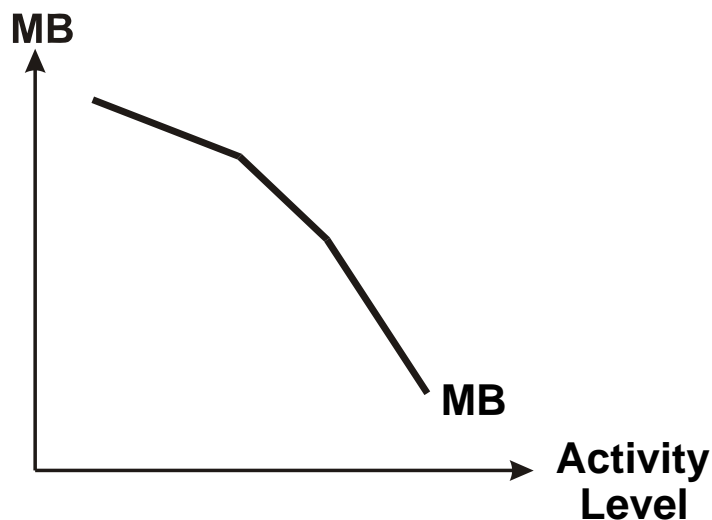
If you decide to undertake an activity, what is the “optimal” level of that activity?

Still focus on benefits and costs but *as activity level changes*

**Marginal value** – additional or extra amount of something that occurs as some factor changes

Marginal Benefit (MB) – additional benefits that result from doing more (or less) of an activity

- as activity level rises, generally total benefit rises, so marginal benefit is positive, BUT
- after a point is reached, as activity level rises further, benefits rise but *at a decreasing rate*
- called **Diminishing Returns**, causing MB to fall



**The steeper the MB curve, the greater is the decline in additional benefits as activity level rises**  
**Q: Can MB ever be negative?**

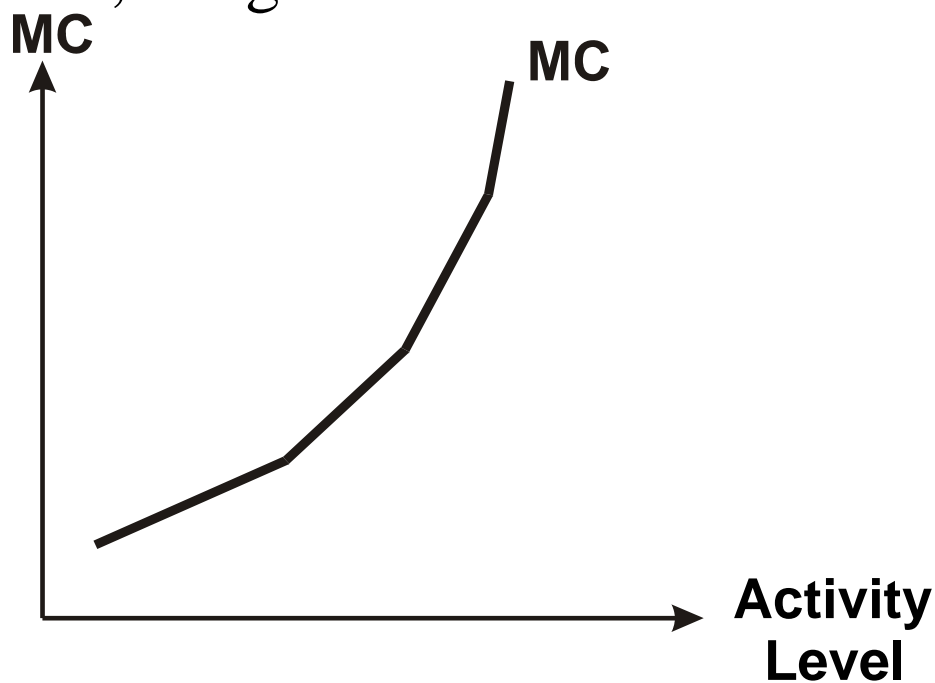
Ex: studying for an exam

Q: The longer you study the higher is your grade, so why not study 120 hours for each exam?

A: There is a maximum grade possible (100%) and while additional hours of study raise your grade, after a few hours, by grades rise by ever-smaller amounts (diminishing returns)

Marginal Cost (MC) – additional costs that result from doing more (or less) of an activity

- as activity level rises, marginal cost rises, so MC is positive. Often, the as activity level continues to rise, the greater is the *increase* in MC



**The steeper is MC,  
the more rapidly  
MC rises with  
greater levels of  
the activity**

## How to determine the “optimal” level of an activity

- consider changes from current level and see if any net gains can be obtained
- this requires comparing MB and MC

Q: If  $MB > MC$ , is this optimal?

A: No, even though it seems like it should

- use the definitions of MB and MC to see this and remember: to “activate” marginal values something has to change – here, activity level
- as activity level rises, then the additional benefits (MB) are greater than the additional costs (MC) that result, so there is a *net gain* from more of the activity

Q: If  $MC > MB$  is this optimal?

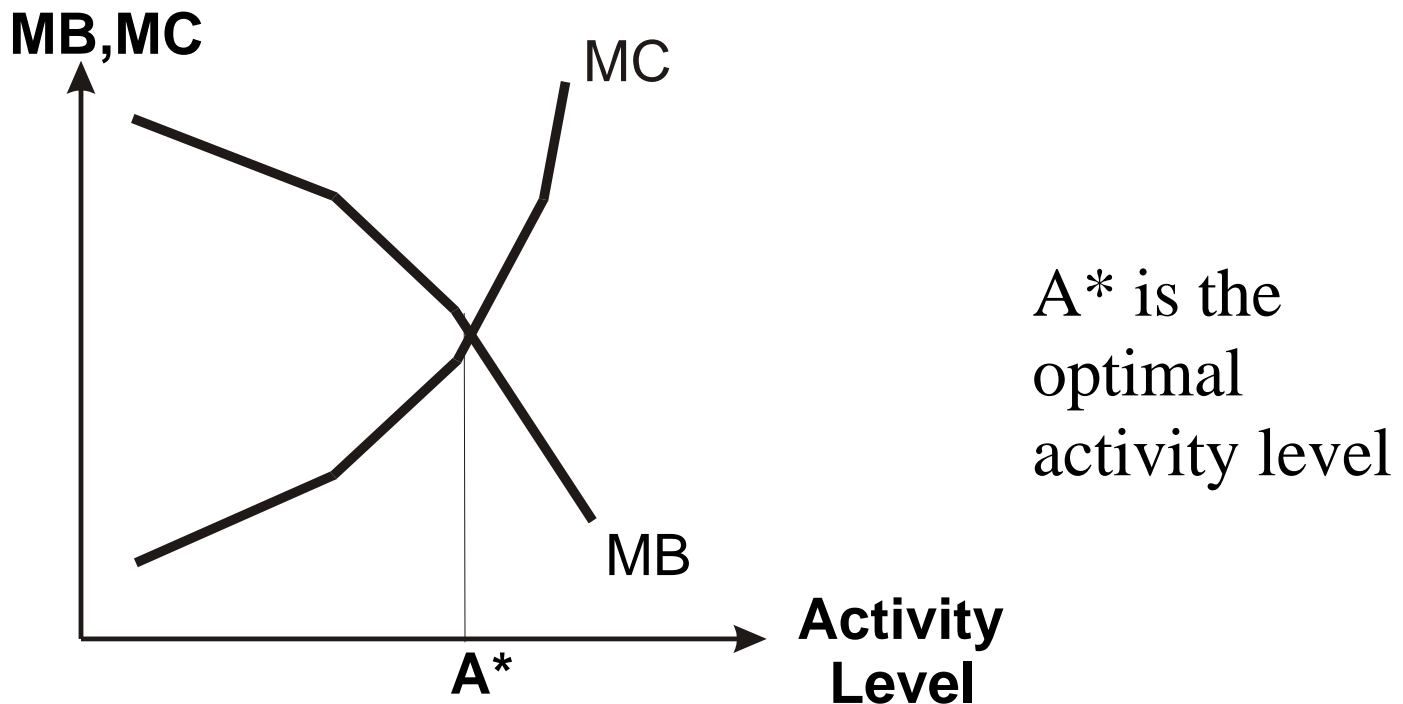
A: No. As activity level rises, the additional costs more than outweigh the benefits that occur, so you are worse off (net loss) from increasing the activity

When does the optimal level occur?

**Rule 2:** Only when  $MB = MC$  – then as activity level rises, the additional gains are exactly offset by the additional costs and no net gain is possible

- this is called the **equi-marginal rule**

Using a graph to see this:



Q: Is the saying: “Anything worth doing is worth doing well” valid in this *economic* framework?

A: Quality has benefits and costs, so it is rational to add quality to what you do, BUT, *perfection is not rational* – the costs far outweigh the benefits

- So, there is an *optimal level of inefficiency*. Add quality as long as the benefits exceed the costs (i.e.,  $MB > MC$ ) up to where  $MB = MC$

Examples:

1) Rational study time for an exam ( $A^*$ ) might only be about 4-7 hours. Why?

As study time rises, grades (benefits) rise, but more slowly after a point (diminishing returns). And, as activity level rises, you have to use more and more time. MC here is the *indirect* cost, or value you place on the other things you could be doing (opportunity cost). The longer you study, the more important (and highly valued) are the things you have to give up (steeper MC).

2) Pollution abatement: Is the “optimal” pollution level zero?

It is almost never economical to remove *all* existing pollution. MB is at first large (generate large gains with little effort). The more abatement, the more difficult to generate further gains (diminishing returns), and additional cost rises sharply. So  $A^*$  occurs where only *a portion* of the pollution is removed. Only remove the pollution for which the benefits are more than worth the cost involved, up to where  $MB=MC$

## How to change the “optimal” level of an activity

- alter MB relative to MC, changing  $A^*$

- *To encourage the level of an activity, raise MB relative to MC*
- *To discourage the level of an activity, raise MC relative to MB*

Using these principles:

Q1: How does government get polluting firms to pollute less?

Q2: How can government help some new industries gain size?

Q3: Why isn't the Ford Focus made as well as a Mercedes?

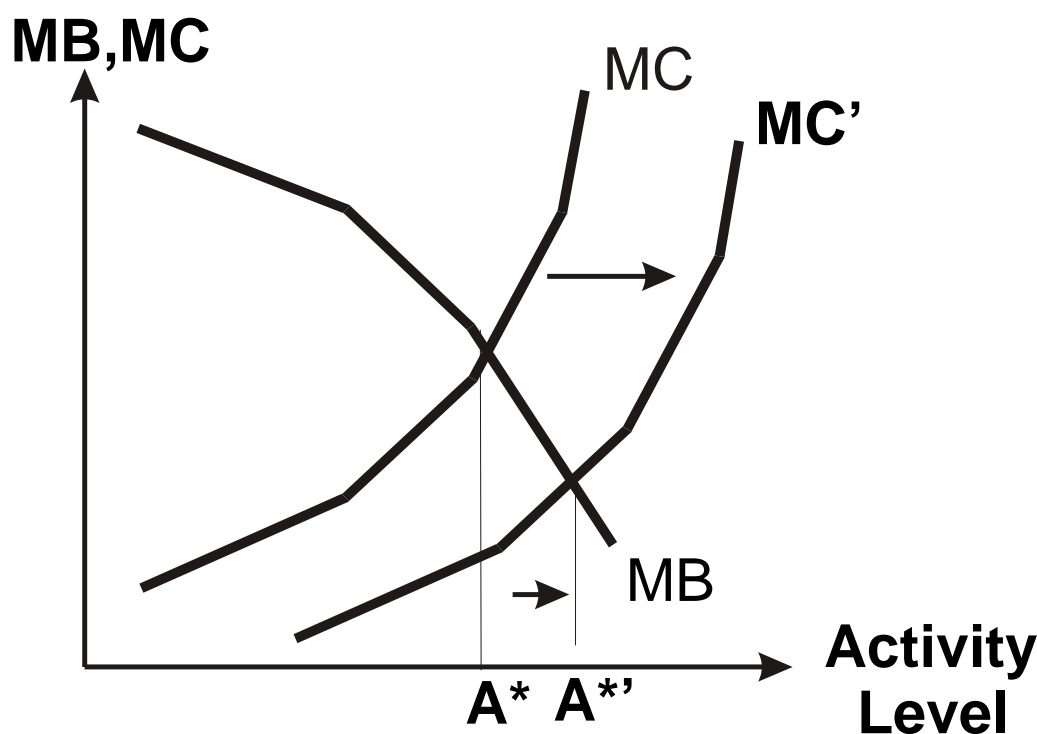
Q4: Why does anyone buy convenience foods (ex: microwavable dinners) since they cost so much more than purchasing individual ingredients?

Q5: Why take a plane to the west coast, since bus tickets cost less than plane tickets?

Q6: If the Block Island Ferry charges \$9 to go from Galilee to Block Island and the High Speed Ferry charges \$13.50, why take the High Speed Ferry?

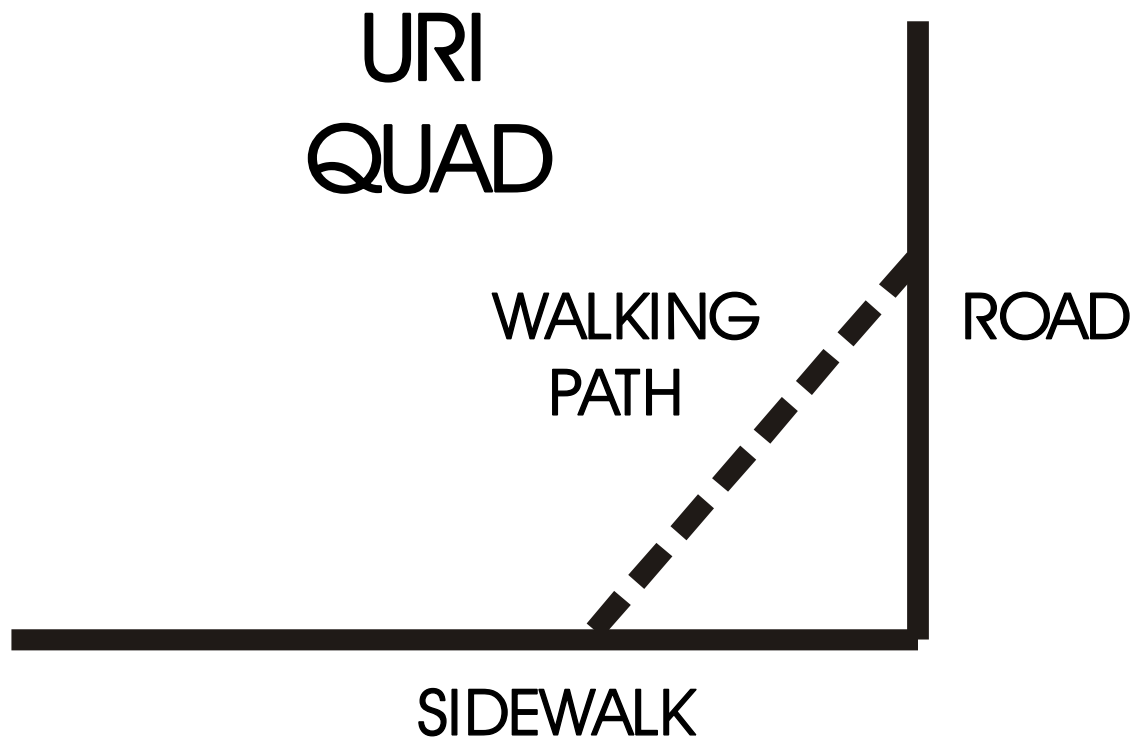
Q7: How do Federal Extended Unemployment Insurance Benefits encourage job search?

A7: By lowering the MC of job search (since persons collect benefits longer), given the MB of job search. The graph illustrates this:



MC is now less for any amount of job search (MC shifts right), given MB (same curve), optimal weeks of job search are now higher (ex: A\* was searching for 11 weeks, now 15 weeks)

**Q1:** What is the rationality of creating and walking on the path on the URI Quad?



**A1:** The path is shorter than walking both the sidewalk and the road (Pythagorean Theorem – hypotenuse is shorter than the sum of the sides). So, benefits exceed costs and  $MB > MC$ .

**Q2:** Why don't as many people walk the path on very rainy and wet days?

**A2:** The mud raises the marginal costs relative to marginal benefits